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surrounds the lateral nucleus (Obersteiner) of the *lemniscus*. *B* is the ventral area which passes mesad into the so-called *lateral lemniscus* (v. Monakow's lateral division of the *lemniscus* of Forel). *C* is the dorsal area which occupies the space between the superior cerebellar peduncle and *A*. *D* is the mesal area of fibres, cut obliquely, which lies mesad of *A* and *B*, and is separated from them by a thin layer of gray matter.

Turning now to the results of the examination of the two animals experimented upon, they show that the dorsal area (*C*) when sectioned causes a degeneration of the dorsal fibres of the superior olive on the operated side, and of the arcuate fibres passing from this part of the superior olive to the dorsal surface of the other side. Since the fibres that take this course go directly to form the *stria acustica*, it is, therefore, the *stria acustica* which degenerate and in connection with them the large spindle-shaped cells lying in the dorsal portion of the *tuberculum acusticum*, so that this group of structures may be considered as physiologically associated. To this area (*C*) of the *inferior lemniscus* v. Monakow gives the designation of "Path of the *stria acustica*" (*Antheil der Stria Acustica*). It does not, however, contain *all* the fibres of the *stria*, since some escape degeneration. Cephalad of the point of the initial lesion there occurs a degeneration in the gray substance of the posterior *bigemina*. Since, therefore, there are two sets of cells involved, in the *tuberculum acusticum* at one end, and the *corpora bigemina* at the other, v. Monakow assumes that two sets of fibres, conducting in opposite directions, have here been sectioned. Considering further the reactions of the posterior *corpora bigemina* to lesions lying cephalad to them, as given in the first part of this review, and now the reaction to a lesion lying caudad, the author suggests that there may be in their gray matter predominantly cells of the second or central type (Golgi), and that they may thus form an intermediate centre between the *medulla* and the cortex.

Dependent on the *inferior lemniscus*, according to these experiments, are the lateral nucleus of the *lemniscus*, and in part the superior olive, both on the same side as the lesion—further, the fibres passing ventromesad from the side of the lesion, and taking part in the ventral decussation of the *tegmentum* and the dorsal fibres (H_2) in the *regio subthalamica*, on the side opposite to the lesion. For the relations of these several degenerations to the areas of the *inferior lemniscus*, as above described, the reader is referred to the original.

V. Monakow's final statement with regard to the "Path of the *stria acustica*" is that he considers these fibres as a secondary tract of the *acusticus* passing cephalad from the *tuberculum acusticum*, and at least once interrupted on its way to the cortex, the point of interruption being probably the gray matter of the posterior *corpora bigemina*; but what the connection between this intermediate centre and the cortex may be, is by no means clear from the experimental evidence at present available. The paper closes with a condensed statement of the relation of the author's views on the subject of the *stria acustica* to those of Flechsig and Baginsky. [It will be remembered that in his study of the path of the optic impressions (see AM. JOURN. PSYCHOL., Vol. II, p. 625), v. Monakow suggested the same arrangements of double sets of fibres conducting in opposite directions, which he here believes to exist in the "Path of the *stria acustica*."—REV.]

La psicologia in rapporto alle ultime nozioni di fisiologia del cervello.
L. BIANCHI. Estratto dagli Atti del IV Congresso tenutosi in Novara dall' 8 al 14 Settembre, 1889. Milano, 1890.

This paper is the report of an address given by Bianchi at the congress above mentioned, and is an example of the efforts now being made on many sides better to utilize the results of experimentation on the

brain for the benefit of psychology. The author urges the study of those phenomena in animals which may be grouped under the general term "changes of character." According to the observations most generally received, the ideational processes are dependent on the integrity of the sensory and motor cortical areas. The question is then asked whether the sense perceptions are due to a simple and elementary reaction of a cortical area, or are complex and based on the association of two or more cortical areas? The instances which the author then adduces from his own experiments and those of others favor the latter view. Bianchi finds vision affected by lesions in the cephalic half of the cerebral hemisphere, in the dog, and the intensity of the disturbance increased as the lesion is carried further caudad. If the place of the excision affects only the amount of the disturbance, it is otherwise with stimulation, where the character of the reaction depends on the point stimulated. For example, the stimulation of the most cephalic portion of his (Bianchi's) cortical area produces closure of the eyelid; of the middle portion, movements of the eyeball; and of the most caudal portion, no movement. When this cephalic area is excised, there are no changes visible in the conjunctiva; yet, stimulation of the conjunctiva in dogs thus operated produces closure of the eyelid, as it would in a normal dog. He, therefore, infers, since the reaction can be gotten as described, after removal of the cortical centre, that when the reaction followed its stimulation it was not direct but due to the indirect excitation of the sensory cells of the visual area. Other instances are given where sensory disturbances follow the lesion of so-called motor areas, and it is concluded that the interruption of associative paths may explain these results. The author's next question is whether there may not be something over and above the sensory and motor centres which controls their action and gives capability for attention. From this point of view he finds, as others have done, dogs from which the extreme frontal cortex has been removed, very instructive. In such a case the animal appears intact, so far as sensation and motion are concerned, but in conduct he is highly deficient. This leads him to the tentative opinion that there is some relation between the completeness of the associative processes and attention and the lack of the latter in the animals in question is explained by the disturbance of the former. His final observation is on the variations in the character of different dogs from which the same amount of cortex has been removed from different regions, and here he obtains the classic results as described by Goltz in his earlier experiments.

The Principles of Psychology. WILLIAM JAMES. 2 Vols. New York, 1890. Henry Holt & Co.

The standpoint of any psychological treatise toward the anatomy and physiology of the nervous system is certainly of interest to those working along the latter lines. In these volumes there is almost no anatomy in the stricter sense of the term. The author's interests are on the physiological side, and certainly what he gives is most admirable. The nerve centres in the encephalon of the frog furnish the introduction to the whole subject, and the reactions of the animal, from the case where it is possessed of nothing but the spinal cord, through the intermediate cases up to the normal individual, are followed and described in accordance with the best results. The well-known scheme of Meynert, representing the child and the candle, and showing the nerve connection in the inexperienced child, who did burn his finger, as compared with the connections established in the same child when experience has acted on it, is used to lead up to the discussion of the education of the hemispheres. A brief allusion to phrenology furnishes here a useful preface, and is followed by as well proportioned a sketch of the history